

## REMARKS

Claims 1-23 are pending. It is respectfully submitted that the present response presents no new issues or new matter and places this case in condition for allowance. Reconsideration of the application in view of the following remarks is requested.

### I. The Rejection of Claims 1-23 under 35 U.S.C. 103

Claims 1-23 are rejected under 35 U.S.C. 103(a) as obvious over Maselli et al in view of Kilbwa. The Examiner states Maselli et al disclose the use of alpha-amylases in preparing breakfast cereals. The Examiner indicates that although Maselli et al do not teach the use of a pullulanase or a maltogenic alpha-amylase, that it would be obvious to substitute these enzymes for the alpha-amylase of Maselli et al because Kilbwa teaches that these enzymes act on starch to product dextrans. In particular, the Examiner states that Applicant's argument that an alpha-amylase, maltogenic alpha-amylase and pullulanase are different enzymes which produce different end products by different enzymatic reactions does not matter because all enzymes produce dextrans, which is the function that Maselli et al use the alpha-amylase for.

This rejection is respectfully traversed. The Examiner relies on the formation of dextrans as the basis for why an artisan would have believed that a maltogenic alpha-amylase or pullulanase would be acceptable for use on the process of Maselli et al. In particular, the Examiner states:

dextrans. As shown by Kilbwa, other enzymes such as maltogenic alpha amylase and pullulanase also act on starch to generate dextrans. This shows that all the enzymes ( alpha amylase, maltogenic alpha amylase and pullulanase) have equivalent function.

Thus, it would have been obvious to one skilled in the art to use another enzyme which has the same function as required by Maselli et al. It would have been within the skill of

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and alpha amylase. Applicant questions how the ability to form dextrins results in the ability to accelerate starch retrogradation. The claims do not have any limitation on acceleration of starch retrogradation relating to the use of the enzyme. The claims recite cooling and holding the gelatinized starch composition to effect retrogradation of the starch and Maselli et al disclose such steps. The obviousness of substituting maltogenic alpha amylase for the alpha amylase in Maselli et al is the ability to form dextrin and Kilbwa shows that maltogenic alpha amylase performs such function.

Applicants respectfully point out that this reasoning is clearly deficient because the Examiner has still not explained how the mere ability to form "dextrins" predicts whether the enzymes are suitable for use in accelerating starch retrogradation. In particular, the Examiner has not explained why the ability to form "dextrins" correlates with the ability to accelerate starch retrogradation. That is, there is no correlation between the formation of dextrins generally and starch retrogradation.

In fact, as disclosed in Maselli et al. it is the formation of "fructose" that is specifically disclosed as a key aspect of the process. In Maselli, the alpha-amylase may be applied to convert the starch to dextrins, however, the dextrose is then treated with a glucoamylase and glucose isomerase to produce fructose. See Col. 12, line 61 to Col. 13, line 20 and Col. 13, lines 36-59. Indeed, the alpha-amylase treatment is stated to be "optional" in Maselli. See Col 13, line 11 and Col. 14, line 15. Therefore, contrary to the Examiner's rejection, Maselli clearly does not teach that the generic, nonspecific formation of dextrins by an alpha-amylase is the critical aspect to promoting starch retrogradation. Hence it cannot also not be concluded that simply because an enzyme produces dextrins, then it is suitable for promoting starch retrogradation.

Indeed, as explained previously explained, the fact that the three enzymes do not have equivalent function is important to understanding why an artisan would not have been motivated to substitute a maltogenic alpha-amylase or pullulanase for an alpha-amylase of Maselli et al. As is well known in the art, alpha-amylases, maltogenic alpha-amylases and pullulanases are different enzymes which produce different end products by different enzymatic mechanisms. See, e.g., the EC classification submitted in the prior response illustrating that alpha-amylase and maltogenic alpha-amylase, e.g., are different enzymes which produce different end products. Although the

enzymes can generally be stated to form “dextrins,” the resulting products are not the same as “dextrins” encompass a large number of starch degradation products.

In sum, the Examiner refers to the formation of dextrins as the equivalent function; however, the Examiner has failed to establish a proper *prima facie* case of obviousness because the Examiner does not indicate how dextrin formation in general relates to starch degradation. Moreover, the enzymes have very different functions and very different end products, which is what an artisan would consider as opposed to fact that each enzyme generally forms dextrins.

The Examiner also previously rejected Applicants argument regarding the absence of a link between starch retrogradation and dextrin formation on the basis that the claims do not have any limitation to acceleration of starch retrogradation. In particular, the Examiner stated:

and alpha amylase. Applicant questions how the ability to form dextrins results in the ability to accelerate starch retrogradation. The claims do not have any limitation on acceleration of starch retrogradation relating to the use of the enzyme. The claims

It is respectfully pointed out that the claims clearly recite the step of retrogradation. See claim 1 (steps c and d); claim 3 (step c); and claim 6 (step c, d and e). In fact, the relation of the enzymes to starch retrogradation is the key aspect of the claims. Thus, contrary to the Examiner’s allegation, the absence of the relevance of the formation to dextrins to the starch retrogradation is relevant as the claims recite the step of starch retrogradation.

It is also respectfully pointed out that the Examiner has not addressed Applicants previous argument that Kilibwa teaches away from the invention. In particular, as Applicants previously explained, Kilibwa discloses that maltogenic alpha-amylases and pullulanases are useful as anti-staling agents—that is, the enzymes are useful in inhibiting starch retrogradation. See Kilibwa, e.g., at col. 2, lines 7-12. Maltogenic alpha-amylases, e.g., are especially well known in the art for use as anti-staling agents to prevent starch retrogradation. See, e.g., US Patent No. RE 38,507. Clearly, Kilibwa’s teaching that the enzymes are useful as anti-staling agents in preventing starch retrogradation (along with the general knowledge in the art as evidenced by RE 38,507) does not then motivate an artisan to use the same enzymes to promote the opposite effect of accelerating starch retrogradation. Thus, Kilibwa is not relevant prior art and does not provide a motivation to use the enzymes to accelerate starch retrogradation.

The Examiner has not responded to this clearly inconsistent teaching in the Kilibwa reference.

Finally, the Examiner indicates that the obviousness of the claims is supported by the specification of the instant application. In particular, the Examiner alleges:

any specific product from the use of maltogenic alpha amylase. While applicant argues all the three enzymes are not equivalent, the disclosure does not support such argument because it discloses the use of all three enzymes. Page 5 discloses all the enzyme-treated products look nicer; the enzymes include maltogenic alpha amylase, and alpha amylase. Applicant questions how the ability to form dextrans results in the

The fact that the specification also describes the use of alpha-amylases has no legal relevance as to whether the claims are obvious. It is plainly improper for the Examiner to rely on Applicant's teaching that all three enzymes can be used as a basis for concluding that two of the three enzymes are obvious in view of a teaching regarding one of the three. It is improper for the Examiner to use teachings in the specification of the instant application, which is not prior art, as supporting grounds for the obviousness rejection

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

## **II. Conclusion**

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

Respectfully submitted,

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